

REMARKS

At the time of the Office Action dated August 19, 2003, claims 1-16 were pending in this application. Of those claims, claims 15 and 16 have been rejected and claims 1-14 have been withdrawn from consideration pursuant to the provisions of 37 C.F.R. § 1.142(b). Claims 15 and 16 have been amended. Applicant submits that the present Amendment does not generate any new matter issue.

On page two of the Office Action, the Examiner objected to the claims based on various informalities. With regard to the Examiner's objection to the term "irregular pattern," Applicant has amended claims 15 and 16 to replace this term with the term "projecting pattern." Since the Examiner has already stated that the term "irregular pattern" has been interpreted as "projecting pattern," Applicant submits that the objection to the term has been traversed. The Examiner also objected to the term "on ... lower layer of ... membrane." Applicant has amended claims 15 and 16 to replace this term with the term "under layer of ... membrane." Since the Examiner has already stated that the objected to term has been interpreted as the newly presented term, Applicant submits that the objection to the term "on ... lower layer of ... membrane" has been traversed.

The Examiner also stated that the recitation of the term "function group" and "group on the surface therefore" is unclear. In response Applicant has amended the term "group on the surface therefore" to read "group on the surface thereof," as suggested by the Examiner. The Examiner is also referred to the paragraph spanning pages 20 and 21 in Applicant's disclosure, in

which support for these terms can be found. On this basis, Applicant submits that the Examiner's objections to these terms have been traversed.

Claims 15 and 16 are rejected under 35 U.S.C. § 103 for obviousness based on Shimada et al., U.S. Patent No. 5,852,485 (hereinafter Shimada), in view of Yih, U.S. Patent No. 3,866,313 and further in view of Suzuki, U.S. Patent No. 6,509,948, and Utsumi et al., U.S. Patent No. 6,441,880 (hereinafter Utsumi)

In the last paragraph of page six of the Office Action, the Examiner asserted that "Suzuki teaches in Figures 2A and 2B defining a gap between the first and second substrate by disposing a spacer, 31, which is smaller than said gap, on a projecting pattern where spacers, 30, remain uncompressed so the liquid crystal molecules will not be subject to anomalous orientation and light leakage will be avoided." The Examiner also argued that "Utsumi teaches in Figures 1, 2, and 9 the use of long-chain alkyl group coated spacers (col. 10, lines 8-11) to improve contrast and view angle (col. 5, lines 36-40, col. 9 and Abstract)" in the first paragraph on page eight of the Office Action. The Examiner then concluded that it would have been obvious to combine these teachings of Suzuki and Utsumi with the combination of Shimada in view of Yih to arrive at the claimed invention. This rejection is respectfully traversed.

Initially, Applicant notes that on page three of the Office Action the Examiner made the following assertion:

As to claims 15 and 16, the structural limitations in these process claims only have patentable weight when they have a non-obvious impact on the process steps, which in general, can be used to make any of a large number of LCD devices with alternate structures.

This assertion, however, does not comport to the law that requires the Examiner to establish that the prior art teach or suggest all of the claimed limitations. The Examiner's assertion that "the process

steps ... can be used to make any ... LCD devices," is without factual basis. With this statement, the Examiner is ignoring well-established general knowledge that certain features can only be manufactured with certain processes and some processes cannot be used to manufacture certain features. Thus, the structural limitations (i.e., the features) found in method claims may limit or exclude certain types of processes. Therefore, the structural limitations must be given patentable weight.

With regard to the Examiner's newly cited references of Utsumi and Suzuki, Utsumi discloses an arrangement in which a spacer is disposed between first and second substrates. An orientation controlling membrane is disposed between the spacer and a liquid crystal layer, and the orientation controlling membrane is irradiated with a deflection beam to apply a liquid crystal orientation. This reduces orientation irregularity in the vicinity of the spacer, and thus, light leakage due to the orientation irregularity is also reduced.

Utsumi, however, does not teach or suggest bringing the spacer into contact only with either the first substrate or the second substrate and fixing the spacer thereto. Moreover, Utsumi does not teach or suggest that the force for bringing the spacer into contact with either substrate is provided via van der Waals bonding or hydrogen bonding. Independent claims 15 and 16 have been amended to recite this feature, which finds full support, for example, on page 21, lines 3-7 of the originally filed disclosure.

Suzuki discloses a liquid crystal panel having spaces between the first and second substrates in which the spacer is interposed. The space at the display picture element portion is

has a diameter larger than that of the spacer, while the space at the portion corresponding to the shading membrane has a diameter smaller than that of the spacer. In Suzuki, the spacer is not arranged to come in contact with and be fixed to only either the first substrate or the second substrate, as recited in claims 15 and 16. At the display picture element portion, the spacer is fixed to neither the first substrate nor the second substrate and moves freely for the stated purpose of preventing liquid crystal molecules from being abnormally oriented. This arrangement in Suzuki is different from the arrangement recited in claims 15 or 16 of the present invention. Moreover, at the portion corresponding to the shading membrane in Suzuki, the spacer is fixed to both first substrate and second substrate and cannot move, which is another difference from the arrangement of claims 15 or 16. Furthermore, at the portion where the spacer and both substrates are fixed to each other, Suzuki does not teach or suggest that the fixation is achieved via van der Waals bonding or hydrogen bonding.

Therefore, none of the applied prior art, either alone or in combination, teach or suggest the following limitations: (i) bringing the spacer into contact only with either the first substrate or the second substrate and fixing the spacer thereto, and (ii) the force for bringing the spacer into contact with either substrate is provided via van der Waals bonding or hydrogen bonding, which are both recited in claims 15 and 16. Applicant, therefore, respectfully solicits withdrawal of the imposed rejection of claims 15 and 16 under 35 U.S.C. § 103 for obviousness based Shimada in view of Yih, Suzuki and Utsumi.

Applicant has made every effort to present claims which distinguish over the prior art, and it is believed that all claims are in condition for allowance. However, Applicant invites the

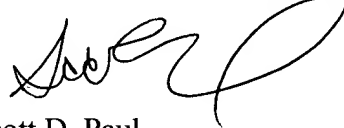
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Examiner to call the undersigned if it is believed that a telephonic interview would expedite the prosecution of the application to an allowance. Accordingly, and in view of the foregoing remarks, Applicant hereby respectfully requests reconsideration and prompt allowance of the pending claims.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417, and please credit any excess fees to such deposit account.

Respectfully submitted,

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